



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/007,003	11/09/2001	Sujal M. Patel	ISIL.001A	9714

20995 7590 08/17/2004

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER

CHEN, TE Y

ART UNIT PAPER NUMBER

2171

DATE MAILED: 08/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/007,003

Applicant(s)

PATEL ET AL.

Examiner

Susan Y Chen

Art Unit

2171

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 43-58 is/are pending in the application.
- 4a) Of the above claim(s) 21-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-20 and 43-58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response to Amendment

This Action is responsive to the amendment filed on 03/19/2001, in which claims 1-20 and 43-58 are pending for examination, claims 1, 13-16 are amended, claims 21-43 are canceled and claims 43-58 are newly added.

Claim Objections

Claim 43 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

As to claim 43, the claimed feature "a file has been stored on a number of intelligent storage devices... wherein the number is equal to or greater than two" already being cited in claim 1, lines 4-5 of the clean copy.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 49-51 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which

Art Unit: 2171

was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As to claim 49, Applicant fails to disclose the claimed "a third" and "a fourth" storage modules. Furthermore, applicant did not specify any link between the claimed third and fourth storage modules, as such, the specification in not enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As to claims 50-51, these claims depends on claim 49, hence are rejected for the same reason.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 5-10, 13-20, 43-46, 54-56, and 58, are rejected under 35 U.S.C. 102(b) as being anticipated by Belsan et al. (U.S. Patent No. 5,403,639).

Art Unit: 2171

As to claims 1 and 43, Belsan et al. (hereinafter referred as Belsan) discloses a distributed file system [e.g., Abstract, Fig. 1 and associated text] communicating with a plurality of intelligent storage devices [e.g. the set of File Storage Units 11-1 to 11-N, Fig. 1, col. 2, lines 10-22], wherein the distributed file system is configured to store and manage metadata about files / directories of the system [e.g., col. 5, lines 2-11], wherein, the data of the at least one of the files stored on the distributed file system span at least two of the intelligent storage devices [e.g., col. 3, lines 16-19; col. 9, lines 36 – col. 10, line 11].

As to claim 2, except the features recited in claim 1, Belsan further discloses that the distributed file system is configured to provide different levels of replication and redundancy information that is stored with the corresponding metadata [e.g., see the snapshot replicating processing, col. 2, lines 26-68, col. 3, lines 11-19; col. 5, Overview of Data Read/Write Operations].

As to claim 5, except the features as recited in claim 1, Belsan further discloses that the file system is configured to change redundancy parameters of a directory when the directory corresponding metadata is updated [e.g., see the steps 624, 625 of Fig. 6; 1005 -1020, Fig. 10; 709-713, Fig. 13; 1504-1506, Fig. 15].

As to claims 6 and 8, except the features recited in claim 5, Belsan further discloses that the file system is configured to copy and replicate data in real-time

throughout a subset of the plurality of intelligent storage devices and store the locations of the copied directory data in the corresponding metadata [e.g., see col. 3, lines 11-36; the Snapshot Copy Operation Using Copy Table at col. 21-22].

As to claim 7, except the features recited in claim 1, Belsan further discloses that the system is configured to move data in real-time, wherein the location of the moved data is stored with the associated metadata [e.g., see col. 22, lines 23-47].

As to claims 9-10, except the features recited in claim 8, Belsan further discloses that the system is configured to replicate data in response to a high volume of requests and high utilization of the storage hardware [e.g. see the Staging and De-staging processing at col. 24 – col. 26 & Fig. 18].

As to claims 13-14 and 46, Belsan discloses the features as claimed by applicant, including

a) a plurality of storage units for storing data blocks [e.g., see the memory(14), the storage structure units of Functional Address Space 12-13, Fig. 1 of Belsan];

b) receive data file read request [e.g. the copy command received by the Data Storage Subsystem, Fig.5 of Belsan];

c) retrieve data file location information corresponding to the request via lookup the locally stored data blocks [e.g. see the look up Virtual Track Address in the Virtual to Logical Map processing 605, Fig. 6 of Belsan], get the requested data from remote

Art Unit: 2171

storage units [e.g., see 605-623, Fig. 6 of Belsan] and return it back to the requestor [e.g., see the return processing (601- 604), Fig. 6 of Belsan; Figs. 5-7, Fig. 11 of Belsan], wherein the retrieved data blocks correspond to the request are distributed among two or more storage units and the number of storage units on which the blocks are stored is determined for the data file [*note*: this is the default nature of a distributed file system].

As to claims 15-16, except all the features cited above, Belsan further discloses the system having a write module in communicating with the switch component [e.g., the module 705, Fig. 13 of Belsan] to write and distribute the plurality of data blocks among at least two of the storage units [e.g., see the write operation of Figs 13 and 15 of Belsan, wherein, the data blocks are distributed to the at least two of the storage units – the cache memory and the secondary media logical device].

As to claims 17-20, except all the features cited above, Belsan further discloses the write module is configured to mirrored data corresponds to the distributed parity protection information of the write request [e.g., see col. 10, lines 13-35 of Belsan].

As to claims 44 and 45, except all the features recited in claim 13 above, Belsan further discloses the blocks include content data and metadata [e.g., 11-1 to 11-N, Fig. 1].

As to claim 54, Belsan discloses a distributed file system [e.g., Fig 1 and associated texts], comprising:

- a) a plurality of storage modules [e.g., the file server system 1, col. 4, lines 30-66];
- b) a file is divided into portions and distributed among at least two of the plurality of storage modules [e.g., col. 16, lines 16-26];
- c) metadata stored in the distributed file system related to the file, wherein the metadata identifies where the portions are stored [e.g., col.3, lines 23-36; col. 4, line 57 – col. 5, line 11] .

As to claim 55, the claimed features are the default nature of a distributed file system.

As to claim 56, except all the features recited in claim 54 above, Belsan further discloses the metadata is stored among at least two of the plurality of storage units [e.g., the units 11-1 to 11-N, Fig. 1];

As to claim 58, except all the features recited in claim 54 above, Belsan further discloses a copy of the file is stored among at least two of the plurality of storage units [e.g., col. 3, lines 11-19].

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4, 11-12, 47-53 and 57, are rejected under 35 U.S.C. 103(a) as being unpatentable over Belsan et al. (U.S. Patent No. 5,403,639) in view of Beardsley et al. (U.S. Patent No. 6,502,174).

As to claims 3-4, Belsan discloses all of the features recited in claims 1 and 2, however, Belsan fails to expressly disclose the redundancy information including parity data stored with corresponding metadata in form of blocks.

However, Beardsley disclosed a storage management system having the redundancy information includes claimed parity information in form of data blocks as claimed by applicant [col. 4, lines 58 – col. 5, line 27; Fig. 2 and associated texts].

Therefore, with both Beardsley and Beardsley teachings in front of him/her, it would have been obvious for an ordinary skilled person in the art at the time the invention was made to be motivated to modify Belsan's system with the metadata structure taught by Beardsley, because by doing so, the combined system would be able to apply the segmented parity information stored in the metadata structure to perform associated storage segment validation or error checking, therefore, result in a faster storage block data recovery in case of system malfunction.

As to claim 57, the combined system of Belsan and Beardsley further disclosed that the metadata further includes error correction data [e.g., Beardsley : col. 4, lines 50 - 60, Fig. 2 and associated texts].

Claim Rejections - 35 USC § 103 (Continue)

Claims 11-12, are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined system of Belsan and Beardsley as applied to claims 1-10 above, and further in view of Mason, Jr. (U.S. Patent No. 5,884, 098).

As to claims 11 -12, the combined system of Belsan and Beardsley did not expressly disclosed the claimed read/write features cited by applicant. However, Mason Jr. (hereinafter referred as Mason) teaches that the claimed features are the general options of the popular storage technology RAID Level 5 processing [e.g. see col. 8, lines 29-32]. As such, it would have been obvious to one of ordinary skilled person in the art at the time the invention was made, to adapt the very popular RAID processing into the combined system of Belsan and Beardsley, because by applying the existing technique of RAID level 5 processing as taught by Mason into the combined system of Belsan and Beardsley, the system would provide a handy read-modify-write operations for storage data block I/O processing.

As to claims 47-53, the steps in the claimed method are deemed to be made obvious by the functions of the apparatus structure as discussed in claims 1-20 and 54-58 in the combination discussed above, hence were rejected for the same reasons.

Response to Arguments

Applicant's arguments with respect to newly amended claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan Y Chen whose telephone number is (703) 308-1155. The examiner can normally be reached on Monday - Friday from 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on (703) 308-1436. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Susan Y Chen
Examiner
Art Unit 2171

May 28, 2004



UYEN LE
PRIMARY EXAMINER